

BEACON POWER

NEXT-GENERATION FLYWHEEL ENERGY STORAGE

PROJECT TITLE:	Development of a 100 kWh/100 kW Flywheel Energy Storage Module		
ORGANIZATION:	Beacon Power Corporation	LOCATION:	Tyngsboro, MA
PROGRAM:	GRIDS	ARPA-E AWARD:	\$2,245,875
TECH TOPIC:	Energy Storage: Stationary	PROJECT TERM:	9/22/10 – 9/21/12
WEBSITE:	www.beaconpower.com		

CRITICAL NEED

Our national electric grid has limited ability to store excess energy, so electricity must constantly be generated to perfectly match demand. Though wind and solar power are promising clean alternatives to fossil fuels, their natural unpredictability and intermittency make them incapable of delivering the power on-demand necessary to operate today's grid. The U.S. needs technologies that can cost-effectively store renewable energy for future grid-use at any location. Flexible, large-scale storage would create a stronger and more robust electric grid by enabling renewables to contribute to reliable power generation.

PROJECT INNOVATION + ADVANTAGES

Beacon Power is developing a flywheel energy storage system that costs substantially less than existing flywheel technologies. Flywheels store the energy created by turning an internal rotor at high speeds—slowing the rotor releases the energy back to the grid when needed. Beacon Power is redesigning the heart of the flywheel, eliminating the cumbersome hub and shaft typically found at its center. The improved design resembles a flying ring that relies on new magnetic bearings to levitate, freeing it to rotate faster and deliver 400% as much energy as today's flywheels. Beacon Power's flywheels can be linked together to provide storage capacity for balancing the approximately 10% of U.S. electricity that comes from renewable sources each year.



IMPACT

If successful, Beacon Power's flywheel would help provide large-scale storage capacity for the national electric grid.

- **SECURITY:** A more efficient and reliable grid would be more resilient to potential disruptions.
- **ENVIRONMENT:** Electricity generation accounts for over 40% of U.S. carbon dioxide (CO₂) emissions. Enabling large-scale contributions of wind and solar power for our electricity generation would result in a substantial decrease in CO₂ emissions.
- **ECONOMY:** Increases in the availability of wind and solar power would reduce fossil fuel demand, resulting in reduced fuel prices and more stable electricity rates.
- **JOB:** Advances in energy storage would result in new high-paying jobs in supporting sectors such as manufacturing, engineering, construction, transportation, and finance.

CONTACTS

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